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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/733,104	12/07/2000	Steven Teig	SPLX.P0004	2615

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EXAMINER

CHU, CHRIS C

ART UNIT PAPER NUMBER

2815

DATE MAILED: 09/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Applicant(s)

09/733,104

Applicant(s)

TEIG ET AL.

Examiner

Chris C. Chu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 12 June 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1 - 17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 - 17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on December 7, 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. §§ 119 and 120**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Response to Amendment***

1. Applicant's amendment filed on June 12, 2002 has been received and entered in the case.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the following phrases "the second section further comprising at least one conductor deposited in a Manhattan direction coupled to a conductor deposited in said preferred diagonal wiring direction" and "the first section further comprising at least one conductor deposited in a diagonal direction coupled to a conductor deposited in the Manhattan wiring direction" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

3. Applicant is required to submit a proposed drawing correction in reply to this Office action. However, formal correction of the noted defect may be deferred until after

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the examiner has considered the proposed drawing correction. Failure to timely submit the proposed drawing correction will result in the abandonment of the application.

***Claim Rejections - 35 USC § 112***

4. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

5. Claims 1 and 17 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

In claim 1, the specification fails to disclose the **second section** further comprising at least one conductor deposited in a **Manhattan direction** coupled to a conductor deposited in said preferred diagonal wiring direction.

In claim 17, the specification fails to disclose the **first section** further comprising at least one conductor deposited in a **diagonal direction** coupled to a conductor deposited in the Manhattan wiring direction.

**A Manhattan style metallization layout may also be called a rectangular, or right-angle rectilinear metallization layout. Such a metallization layout is characterized by raised, elongate structures that have only substantially right-angle deviations from being straight or linear. ... (column 1, lines 52 ~ 60 of Juengling).**

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 1 ~ 9, 11 and 13 ~ 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juengling.

Regarding claim 1, Juengling discloses in Fig. 8 an integrated circuit comprising:

- at least one metal layer comprising a plurality of sections, each section comprising conductors situated in a contiguous area to interconnect points on the integrated circuit, wherein a preferred direction, within a section, defines a direction, relative to the boundaries of the integrated circuit, for at least fifty percent of conductors in the section;
  - a first section (left-down side of 817) comprising a first preferred direction for the conductors deposited in the first section; and
  - a second section (left-up side of 817) comprising a preferred diagonal wiring (801L, 802L, 803 or 804L) direction for the conductors deposited in the second section, such that the diagonal wiring preferred direction is a direction different from the first preferred direction, said second section (left-up side of 817) further comprising at least one conductor (842)

deposited in a Manhattan direction coupled to a conductor deposited in said preferred diagonal wiring direction (804L).

Juengling does not disclose at least one thousand conductors situated in a contiguous area. It would have been obvious to one having ordinary skill in the art at the time of the invention was made to adding at least one thousand conductors in a contiguous area, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). The ordinary artisan would have been motivated to modify Juengling in the manner described above for at least the purpose of increasing speed of the package.

Regarding claim 2, Juengling discloses in Fig. 8 the first preferred direction comprising a diagonal direction.

Regarding claim 3, Juengling discloses in Fig. 8 the first preferred diagonal direction comprising a direction perpendicular to said preferred diagonal wiring direction in said second section.

Regarding claim 4, since Juengling does not limit the diagonal direction to any particular or specific direction, hence his/her disclosure encompasses all well known direction including an "octalinear direction."

Regarding claim 5, since Juengling does not limit the diagonal direction to any particular or specific direction, hence his/her disclosure encompasses all well known direction including a "hexalinear direction."

Regarding claim 6, Juengling discloses in Fig. 8 the first preferred direction comprising a first diagonal direction; and the second preferred direction comprising a second diagonal direction, different from the first diagonal direction.

Regarding claim 7, since Juengling does not limit the first or the second diagonal direction to any particular or specific direction, hence his/her disclosure encompasses all well known direction including an “octalinear direction” and the second diagonal direction is complementary to the first diagonal direction.

Regarding claim 8, since Juengling does not limit the first or the second diagonal direction to any particular or specific direction, hence his/her disclosure encompasses all well known direction including a “hexalinear direction” and the second diagonal direction is complementary to the first diagonal direction.

Regarding claim 9, since Juengling does not limit the first or the second diagonal direction to any particular or specific direction, hence his/her disclosure encompasses all well known direction including an “octalinear direction” for the first diagonal direction and a “hexalinear direction” for the second diagonal direction.

Regarding claim 11, Juengling discloses in Fig. 8 at least one more additional section (right side of 817) having a preferred direction comprising a diagonal direction.

Regarding claim 13, Juengling discloses in Fig. 8 at least one additional wire (832) deposited in a section with a direction different than the preferred direction of the section.

Regarding claim 14, Juengling discloses in Fig. 8 the preferred direction comprising a diagonal direction; and the direction different than the preferred direction comprising a Manhattan direction (842).

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Regarding claim 15, Juengling discloses in Fig. 8 the preferred direction comprises a Manhattan direction (842); and the direction different than the preferred direction comprises a diagonal direction.

Regarding claim 16, Juengling discloses in Fig. 8 the direction different than the preferred direction comprising a direction complementary to the preferred direction.

Regarding claim 17, Juengling discloses in Fig. 8 an integrated circuit comprising:

- at least one metal layer comprising a plurality of sections, each section comprising conductors situated in a contiguous area to interconnect points on the integrated circuit, wherein a preferred direction, within a section, defines a direction, relative to the boundaries of the integrated circuit, for at least fifty percent of conductors in the section;
- a first section (left-up side of 817) comprising a Manhattan wiring (842) direction for the conductors deposited in the first section; the first section further comprising at least one conductor deposited in a diagonal direction (804L) coupled to a conductor deposited in the Manhattan wiring direction; and
- a second section (left-down side of 817) comprising a preferred diagonal wiring (805) direction for the conductors deposited in the second section, such that the diagonal wiring preferred direction is a direction different from the first preferred direction.

Juengling does not disclose at least one thousand conductors situated in a contiguous area. It would have been obvious to one having ordinary skill in the art at the



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time of the invention was made to adding at least one thousand conductors in a contiguous area, since it has been held that discovering an optimum value of a result effective variable involves only routine skill in the art. In re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). The ordinary artisan would have been motivated to modify Juengling in the manner described above for at least the purpose of increasing speed of the package.

8. Claims 10 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juengling as applied to claim 1 above, and further in view of Rostoker et al. (U.S. Pat. No. 5,650,653).

Regarding claim 10, Juengling discloses the claimed invention except the first preferred direction comprising a first Manhattan direction. However, Rostoker et al. discloses in Fig. 2 a first preferred direction comprising a first Manhattan direction (the top part of 152 in an area 238). Thus, it would have been obvious to one of ordinary skill in the art at the time when the invention was made to further modify Juengling by using a first Manhattan direction for a first preferred direction as taught by Rostoker et al. The ordinary artisan would have been motivated to further modify Juengling in the manner described above for at least the purpose of decreasing electromigration failure (column 4, lines 15 ~ 17 of Juengling).

Regarding claim 12, Juengling discloses the claimed invention except at least one more section having a preferred direction comprising a Manhattan direction. However, Rostoker et al. discloses in Fig. 2 at least one more section having a preferred direction comprising a Manhattan direction (the top part of 152 in an area 238). Thus, it would

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have been obvious to one of ordinary skill in the art at the time when the invention was made to further modify Juengling by using a Manhattan direction for a preferred direction in at least one more section as taught by Rostoker et al. The ordinary artisan would have been motivated to further modify Juengling in the manner described above for at least the purpose of decreasing electromigration failure (column 4, lines 15 ~ 17 of Juengling).

### *Response to Arguments*

9. Applicant's arguments with respect to claims 1, 3, 7 – 9 and 14 - 16 have been considered but are moot in view of the new ground(s) of rejection.

### *Conclusion*

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the

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advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Chris C. Chu whose telephone number is (703) 305-6194. The examiner can normally be reached on M-F (10:30 - 7:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on (703) 308-1690. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7382 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Chris C. Chu  
Examiner  
Art Unit 2815

c.c.  
September 19, 2002



EDDIE LEE  
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